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ABSTRACT

Quantitative and qualitative research are differing modes of measurement, one using numbers and the other not. The assignment of numerals to represent properties enables a researcher to distinguish minutely between different properties. The major issue dividing these approaches to empirical research represents a philosophical dispute which has traditionally been resolved in one of four ways. In classical metaphysics, qualities have been conceived as objective, non-natural properties. They are seen as objective facts which reside outside of nature and cannot be known through experience, or studied scientifically. In phenomalism, qualities have been conceived as subjective and could not be studied rationally or scientifically. Subjective, rather than objective, reality is important to this method. In positivism, qualities have been conceived as objective natural properties ultimately reducible to quantities. This view considers qualities as such to be a function of perception. Abstract ideas are meaningful to the positivist only if they can be defined in terms of concrete, particular things. The pragmatic view maintains qualities can be studied scientifically, as well as rationally. This view thinks of the empirical world as encompassing features that are inherently abstract. The author believes pragmatism provides the strongest case for qualitative research. (DWH)

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ON THE DISTINCTION BETWEEN QUANTITATIVE AND QUALITATIVE RESEARCH

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There has been much said and written in recent years about quantitative vs. qualitative research. The debate is by no means a new one; it is just that nowadays it seems to be especially intense. What is the nature of this controversy and how is it to be explained? I want to argue that while the distinction between quantitative and qualitative research is in one sense purely methodological, it is presently serving as the focus for deeper philosophical concerns. That is, while the concepts here involved are on one level intended primarily, or even exclusively, to tell us how inquiry should proceed, their significance in current thinking is both epistemological and ontological.

Seen as a methodological distinction, 'quantitative' and 'qualitative' denote two modes of measurement, one using numbers and the other not. Thus understood, quantity and quality are hardly antithetical. According to Abraham Kaplan,

> Quantities are <u>of</u> qualities, and a measured quality <u>has</u> just the magnitude expressed in its measure. In a less metaphysical idiom, we could say that whether something is identified as a quality or as a quantity depends on how we choose to represent it in our symbolism. Predicates not assigned in terms of a scale (or perhaps, not in terms of an extensive scale, at any rate) specify qualities; when an appropriate scale has been introduced, we identify their referents as quantities. Conversely, we may begin

> with a set of measures, then introduce labels which mark out qualities, that is, properties considered apart from their scaling.[1]

As a methodological strategy there is not much to argue about here. It is merely a question of whether there is any utility in expressing the data in numbers. That science would find that there is, at least sometimes, is not surprising in the least. Quantitative specification allows us to bring our scientific disagreements to a sharper and more illuminating focus. Discriminations are more subtle, classifications less ambiguous and descriptions more precise. We assign numerals to represent properties because, among other reasons, Norman Campbell has said, "such assignment enables us to distinguish easily and minutely between different but similar properties."[2]

But nowadays, when people talk about the pros and cons of quantitative vs. qualitative research they seem to have other things on their mind. Not how best to present the data, but chiefly they are concerned with how the data are gathered and verified and, ultimately, with the basic character of these data. Admittedly, such concerns are related to methodology. Any given research strategy will presuppose an epistemology; and this; in turn, will somehow be tied to conceptions of reality. But the fact remains, these concerns involve more than methodology.

The major issue presently dividing quantitative and qualitative approaches to empirical research is as old as science itself. It represents one of those perennial philosophical disputes that simply will not go away. Just when we think we have it licked we discover some new factor that forces us to reconsider our stance.

The issue is this: Does nature possess irreducible objective qualities that can be known and studied by science? If the qualities we experience are not objective, if they are merely functions of our perception, they could not conceivably be studied scientifically. For as we all know perfectly well, science can only study what exists independently of our volition. Moreover, unless these qualities exist objectively as qualities, they cannot be studied as qualities. If we were to find, for example, that they exist objectively only as quantities, they could only be studied as quantities, at least insofar as they could be studied scientifically. Here we might add that, by itself, objectivity does not define suitable scientific subject-matter. Science is limited to the study of nature and could not investigate non-natural facts or relations even if these turned out to be more than our subjective projections.

Using this idea of science we might profitably review four ways in which the quantitative-qualitative dispute has traditionally been resolved. First, qualities have sometimes been conceived as objective non-natural properties. In this case, while we might be able to study them rationally we could not study them scientifically. Qualitative research would fall outside the bounds of empiricism. For it would not assume the conviction of empiricism that substantive knowledge can only be gained through experience. This is obviously the view of classical metaphysics, a view that retains some support even today, especially in the area of value inquiry. From this perspective, qualities are seen as objective facts or relations that reside outside of nature. Insofar as they can be known it is not through experience, and insofar as they can be studied it is not scientifically.

Second, qualities have sometimes been conceived as subjective. Here they could not be studied rationally or scientifically. Qualitative research would fall outside the bounds of empiricism not because it failed to deal with natural phenomena, but because it failed to deal with an independently existing world. This represents the view of phenomenalism or solipsism and is intended not so much as a criticism of qualitative research as it is a criticism of empiricism and science. In this scheme what is really important is not objective reality, but subjective reality. Any approach to inquiry which denies this is assumed to be inherently misleading and in conflict with human welfare.

Third, qualities have sometimes been conceived as objective natural properties that are ultimately reducible to quantities. The great British physicist of the 1800's, Lord William Thomson Kelvin (1824-1907) said that,

> When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind: it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be.[3]

If this were true, we could study qualities scientifically as well as rationally. But notice, we could not study them as qualities, at least not scientifically. In order to be studied scientifically qualities must be studied in quantitative terms. Qualitative research might indeed be scientific, but scientific research would amount to the study of quantities.

This is the posture maintained by positivism, broadly conceived. Positivism, like phenomenalism, considers qualities as such to be a function of perception. But it differs from phenomenalism in its depreciation of subjective reality, and in its corresponding interest in the objective aspects of nature. Thus, empiricism and science are held in high esteem, while other modes of knowing and conceptions of inquiry are depicted as trivial or downright perverse.

For the positivist, abstract ideas are meaningful only if they can be defined in terms of concrete particular things. And qualities, values, for instance, can be understood scientifically only to the extent they are reducible to hard physical facts. Surprisingly, this seems to be Kaplan's view.

> The vocabulary of "hot" and "cold" has no other denotation than that which belongs to the temperature scale; color words do not name something other in the furniture of the world than is named by the specifications of wave length. (Of course, the sensation of blue is something different from the color. It is not itself a quality but a perceptual event or process which we conveniently describe by reference to the quality; but it can equivalently be described as the sensation of light of such-and-such a wave length.)[4]

We are told that the transformation of quality into quantity, or conversely, "is a semantic or logical process, not a matter of ontology." Yet, as a methodology this transformation of quality into quantity presupposes an ontology. Were it always possible, as positivists believe, the implication would be that whatever exists exists in some amount,

and whatever exists in some amount can be measured, i.e., quantified. Science would advance in the last decimal place, so to speak. Where qualitative research does not adopt this faith it is not literally or legitimately scientific.

Lastly, qualities have sometimes been conceived as irreducible objective properties of nature, related to quantities in necessary ways, but nevertheless distinct. As with positivism, this fourth view maintains that qualities can be studied scientifically as well as rationally. But here there is no assumption of reductionism. Qualities are seen as having a reality of their own and are not conceived or studied as quantities. This requires that nature be seen more broadly than in any of the other three views. These other views limit nature to hard physical facts, whereas this last view, let me call it the pragmatic view, thinks of the empirical world as encompassing features that are inherently abstract.

At the heart of the argument for qualitative research is the belief that at least in the social sciences there are objective natural properties that cannot be expressed in quantitative terms without to some degree denying their reality. "In this perspective, knowledge--and particularly, knowledge of human beings--consists in the apprehension of qualities, which in their very nature elude the net of number, however fine its mesh."[5] If you can measure it, that ain't it, so the argument goes. Categories like "senior citizen," "well-to-do," and "feeble-minded" cannot be specified numerically in terms of "age," "income," and "intelligence" without a corresponding loss of meaning. For the truth is that these categories can only be understood "phenomenologically." That is, they must be studied through reason as well as through experience, thoughtfully

or reflectively as well as empirically. An exclusive preoccupation with quantities is disastrous. Not that quantities are unimportant, but, after all, a fever is not the same as a temperature and the patient is not reducible to the patient's chart. None of these elements should be denied their unique character, their objectivity, nor their importance in the research process.

On the level of common sense this is perfectly obvious. So the question becomes not why pragmatists reject the positivist's analysis, but why positivists support it so adamantly. The reason is simple. Phenomenological categories are exceedingly difficult to understand and even harder to treat within an empirical scientific framework. The subject-matter of social research invites misunderstanding and disagreement. The blame for this is oftentimes put on the research itself. Thus, it is indecisive not because of the volatile or idiosyncratic nature of the subject-matter, but because, as scientific research, it is not sufficiently "rigorous."

Now, rigor is a function of method. To be rigorous is to employ a methodology that is conceptually clear and consistent, that reduces and, preferably, eliminates bias or subjective influences (or what usually amount to the human input of the researcher), and, perhaps most importantly, that minimize the ways in which the data might be rationally interpreted. The fewer the better, and the ideal situation is where there is only one interpretation possible, as in a formula or technique. This is a rigorous methodology, one which can be defended as neither ambiguous nor vague. It was because of less than rigorous research that Gottfried Wilhelm Leibniz (1646-1716) held out hope for a universal language of ideas, a symbolic

logic as it were, in which all propositions could be precisely formulated. With the proper symbolism, said he, metaphysicians would no longer be forced to engage in fierce and endless controversy, but, putting their arms on each other's shoulders in the friendliest fashion they would say, "Come, let us calculate!"

His hopes have not been realized, for modern logic has only given metaphysicians something else to argue about--and, alas we must concede, so has the positivist's methodology in the social sciences. The practice has been to decide on the most rigorous research strategy prior to the conduct of inquiry, and this typically has relied almost exclusively on quantification. But quantification may or may not be appropriate for the subject-matter being studied, it may or may not be suitable for studying that reality.

In order to be meaningful social inquiry must be rigorous. But in order to be significant it must deal with the Truth, as William James (1842-1910) said, Truth with a capital "T". To be rigorous is one thing, to focus on a substantive reality is quite another. Social inquiry can be criticized for ignoring either. Science requires that methodology allow for significance, just as it requires that truth allow for meaning. If it be granted that the subject-matter of science must allow for a rigorous methodology, else it be nothing but pseudo-science, it must also be granted that the methodology must relate to the facts, and <u>need be no more rigorous than the subject-matter permits</u>.

That the proper mix can be difficult to discern is illustrated by an encounter that took place between Alfred North Whitehead (1861-1947) and Bertrand Russell (1872-1970) during the days of their collaboration

on the Principa Mathematica. As reported by William Barrett in his book, The Illusion of Technique, Whitehead had been puzzled and fascinated for some time that in almost all matters Russell came at things from a different angle from his own. Finally, he observed to his friend: "You know, there are two kinds of people in the world: the simple-minded and the muddleheaded." And when Russell waited for the application, Whitehead immediately gave it: "You, Bertie, are simple-minded; I am muddleheaded." As Barrett observes,

> The terms are playful and ironic, but their intent is serious and perceptiveness acute. We are reminded of William James' classification of "tough-minded" vs. "tender-minded" thinkers. But "tough" and "tender" connote certain factors of aggressiveness and of the will, while Whitehead's distinction is more purely intellectual. The "simple-minded" fasten upon the clear fragments of fact that lie in the foreground to the neglect of the complex background of reality against which those facts emerge. The "muddleheaded," on the other hand, are so engrossed in this complexity of background that enters into every atom of fact that clarity of expression emerges dimly if at all.[6]

This is not to say that social research must be either simple-minded or muddleheaded. Behind Whitehead's distinction there rages the long-standing philosophical controversy between those who would adopt an atomistic orientation to inquiry and those who would adopt a process orientation. Or, as we might say, there are those who regard qualities

as crude expressions of quantities, on the one hand; and on the other hand, there are those who believe that qualities are sometimes unquantifiable.

Those adopting a process orientation and who argue for qualitative research mean to deny that quantitative methods are always required by science; that while methodology should always be as rigorous as possible, it can be no more rigorous than the subject-matter permits. A methodology might be extremely rigorous, but if it is not suited to the subject-matter, it will not aid in our understanding. It is no criticism of methodology to say that it is ambiguous and vague if the reality to which it is applied is also ambiguous and vague. James knew this perfectly well:

> The most useful investigator, because the most sensitive observer, is always he whose eager interest in one side of the question is balanced by an equally keen nervousness lest he be deceived. Science has organized this nervousness into a regular technique, her so-called method of verification; and she has fallen so deeply in love with the method that one may even say she has ceased to care for truth by itself at all. It is only truth as technically verified that interests her. The truth of truths might come in merely affirmative form, and she would decline to touch it. Such truth as that, she might repeat with Clifford, would be stolen in defiance of her duty to mankind. Human passions, however, are stronger than technical rules. "Le coeur a ses raisons," as Pascal says, "que la raison ne connait pas;" and however indifferent to all but the bare rules of the game the umpire, the abstract intellect, may be, the concrete players who furnish him the materials to judge of are usually, each one of them, in love with some pet 'live hypothesis' of his own.[7]

This is essentially an argument against formular research. Science is more than a method, it is a philosophy. If we say, as positivists do, that scientific data can always be quantified, we presuppose quantifiability as a necessary condition for deciding what counts. Behind every methodological principle lurks epistemological, ontological and even axiological commitments.

In the eyes of those who reject positivism, reason cannot be reduced to technique. Technique applies only to how we think, just as methodology applies only to how we conduct our research. It focuses on rigor while ignoring reality. Reason, however, has as much to do with what we think as how. It has as much to do with the substance of our thought as with the form.

If science is a philosophy and not merely a method, reason is more than a process of calculation, more than what has come to be seen in social and political philosophy as "technical rationality" which bears only on the means, not the ends, of our actions. Rationality in science, as in other modes of life, represents what John Dewey (1859-1952) called "intelligence," a thoughtful consideration within experience of both the purposes and instrumentalities of inquiry. On this rendering truth and meaning arise from the same transactional process.

In my judgment, pragmatism provides the strongest case for qualitative research. Unlike the classical view and phenomenalism, it displays a healthy respect for quantitative research, even in the study of the person, and defines qualitative research within the bounds of science. Unlike positivism, it does not violate our sensibilities by always referring to qualities as quantities. When description gives way to measurement, calculation replaces debate, and without debate scientific understanding is impossible. Reason

in science demands rigorous and disciplined inquiry, but most human qualities, and, perhaps, even some that are not, must be studied through conversation. As Kaplan observes, "Let's get down to something we can count!" does not always formulate the best research strategy. "Let's see now, what do we have here?" may point to a more promising program.[8]

There are still plenty of problems for those who wish to develop or employ this conception. But at least it does not begin from a posture that, one way or another, makes qualitative research scientifically impossible or beside the point. For this we should be encouraged.

Footnotes

1 Abraham Kaplan, The Conduct of Inquiry. (San Francisco: Chandler Publishing Company, 1964), p. 207.

2 Norman Campbell, What is Science? (New York: Dover Publications, Inc., 1953), p. 132.

3 Lord William Thomson Kelvin, Popular Lectures I (Quoted in Kaplan, The Conduct of Inquiry, p. 172.)

4 Kaplan, The Conduct of Inquiry, pp. 207-208.

5 Ibid., p. 206.

6 William Barrett, The Illusion of Technique. (New York: Anchor Press/ Doubleday, 1979), pp. 17-18.

7 William James, The Will To Believe and Other Essays in Popular Philosophy. (New York: Dover Publications, Inc., 1956), p. 21

8 Kaplan, The Conduct of Inquiry, p. 171.